[0085] Referring to FIG. **5**, the power transmitter **120** includes an inverter **121**, a variable resonator **122**, and a capacitance controller **123**.

[0086] The inverter **121** includes a plurality of switches. The inverter **121** operates the variable resonator **122** by a switching operation according to the control of the controller **130** (please refer to FIG. **3**).

[0087] In the embodiment illustrated in FIG. **5**, the inverter **121** is a half-bridge inverter in which two switches Q**2** and Q**3** are connected in series, but is not limited thereto. Accordingly, the inverter **121** may be another type of inverter such as a full-bridge inverter, or other suitable inverter implementation. The inverter **121** is controllable in a fixed frequency method, a variable frequency method, a duty ratio modulation method, a phase shift method, or other suitable scheme, as would be known to one of skill in the art after gaining a thorough understanding of the following description.

[0088] The variable resonator **122**, according to an embodiment, includes a variable capacitor and an inductor.

[0089] In some embodiments, the variable resonator **122** includes a variable capacitor having a ladder structure. For example, as illustrated in FIG. **5**, the variable resonator **122** includes a plurality of capacitors C, C**1**, and C**3** connected in parallel and a plurality of switches SW**1**, SW**2**, and SW**3** respectively connected to at least portions of the plurality of capacitors C, C**1**, and C**3** in series. Resonance impedance of the variable resonator **122** is changed according to the change of capacitance of the variable capacitor.

[0090] The capacitance controller **123** controls the capacitance of the variable resonator **122** according to a control signal provided by the controller **130** (please refer to FIG. **3**).

[0091] In some embodiments, the number of bits of the class information is the same as the number of capacitors connected in parallel in the variable capacitor. In this case, a bit value corresponding to the class information is used as a switching signal of the capacitors connected in parallel in the variable capacitor. For example, in Table 6, the class information includes four bits, and the number of parallel capacitors illustrated in FIG. **5** is four. In this case, three lower bits of the class information are respectively used as a switching control signal of the switches SW**1**, SW**2**, and SW**3**. In an embodiment, the controller controls variable capacitance without an additional calculation process.

[0092] In the embodiment illustrated in FIG. **5**, the variable resonator **122** changes capacitance to change impedance, but is not limited thereto. Accordingly, the variable resonator **122** according to the embodiment changes inductance to change impedance.

[0093] FIG. **6** is a flowchart illustrating a method of controlling a wireless power-transmitting apparatus according to an embodiment. In a selection phase illustrated in FIG. **6**, an approach of an object is detected by transmitting an analog ping signal. The method of controlling the wireless power-transmitting apparatus illustrated in FIG. **6** is performed in the wireless power-transmitting apparatus described with reference to FIGS. **3** to **5**.

[0094] Referring to FIG. **6**, the wireless power-transmitting apparatus transmits the analog ping signal (S**610**).

[0095] The wireless power-transmitting apparatus detects the approach of a predetermined device, such as a wireless power-receiving apparatus, when a change (e.g. change in impedance) of the analog ping signal is detected (S**620**, YES). When the approach of the predetermined device is not detected (S**620**, NO), the wireless power-transmitting apparatus periodically transmits the analog ping signal (S**610**).

[0096] The wireless power-transmitting apparatus transmits a ping signal (S**630**).

[0097] When a response signal of the wireless power-receiving apparatus to the ping signal is received (S**640**, YES), the wireless power-transmitting apparatus verifies class information of the wireless power-receiving apparatus from the response signal (S**650**).

[0098] When the response signal of the wireless power-receiving apparatus to the ping signal is not received (S**640**, NO), the wireless power-transmitting apparatus continues to re-transmit the ping signal (S**630**).

[0099] The wireless power-transmitting apparatus changes the impedance of a variable resonator in response to the class information (S**660**).

[0100] In some embodiments, the class information includes a plurality of classes which are classified according to at least one of the types, required power, and impedance information of the wireless power-receiving apparatus.

[0101] Table 7 below illustrates an example of the classes.

TABLE 7

Class	Division	Comment
0000	Phone	Mobile Phone
0001	Wearable	Product Family having different impedance from Mobile Phone
nnnn	Others	Total 16 types are represented with four bits.

[0102] In some embodiments of the step S**650**, the wireless power-transmitting apparatus obtains the class information from the reserved location of the configuration packet included in the response signal.

[0103] For example, as illustrated in Table 6, the class information corresponds to the lower four bits included in the second block of the configuration packet.

[0104] In some embodiments of the step S**660**, the wireless power-transmitting apparatus checks a first impedance corresponding to the verified class information, and controls the capacitance of the variable resonator in such a manner that the variable resonator has substantially the first impedance. In one or more embodiments, the impedance value according to class information is stored in or externally input to the wireless power-transmitting apparatus in advance.

[0105] In other embodiments of the step S**660**, the wireless power-transmitting apparatus verifies a plurality of bits corresponding to the verified class information, and uses the plurality of bits as control signals of the plurality of switches included in the variable resonator.

[0106] In some embodiments, the method of controlling the wireless power-transmitting apparatus further includes magnetically coupling the variable resonator having the changed impedance with a resonator of the wireless power-receiving apparatus to wirelessly supply power.

[0107] FIG. **7** is a block diagram of a wireless power-receiving apparatus according to an embodiment.

[0108] Referring to FIG. **7**, a wireless power-receiving apparatus **200** includes a power receiver **210** (including a resonator) and a rectifier **220**. In some embodiments, the wireless power-receiving apparatus **200** may further include a converter **230** and/or a controller **240**.